

Serial No. 09/600,732  
Docket No. TIENSE RAFF.26  
Amendment E under Rule 116

**AMENDMENTS TO THE CLAIMS:**

Please cancel claim 71, without prejudice. Kindly amend claims 65 and 90, as shown below.

This listing of claims will replace all prior versions and listings of claims in the Application:

**Claim 1 - 64 (previously cancelled)**

**Claim 65 (currently amended):** In a process for the manufacture of chicory inulin from chicory roots through conventional manufacturing techniques, the improvement wherein which comprises:

- the using as a source material for the process are roots of chicory which have been grown in appropriate regions and have been seeded, grown and processed in a period that partially or wholly falls outside conventional seeding, growing and processing periods, and which have been grown and processed under proper climatological temperature conditions which are such that during a period of at least from the beginning of the third month of the growing period till the end of the processing of the chicory roots the fructan exohydrolase (FEH) gene in the chicory roots has not been triggered by the occurrence of low temperature conditions which are such that the temperature in a thermometer shelter shall not have dropped below minus 1°C.

- said chicory roots have had a growing period of at least 150 days,

- said chicory has been seeded

- in the northern hemisphere within a period selected from the periods ranging from December 1 till March 14, from March 15 till May 14, from May 15 till May 31, from June 1 till June 14, and from June 15 till November 30, provided that when said chicory has been seeded in

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the periods from May 15 till May 31, and from June 1 till June 14, the chicory roots have had a growing period of at least 180 days, and provided that when said chicory has been seeded in the period from March 15 till May 14, the chicory roots have been grown and processed under climatological conditions wherein, within a period of at least 220 consecutive days immediately preceding the end of the processing of the roots, no low temperature conditions occurred which triggered the FEH gene, and the chicory roots have had a minimum growing period of at least 160 days,

in the southern hemisphere within a period selected from the periods ranging from June 1 till September 14, from September 15 till September 30, from October 1 till November 14, from November 15 till November 30, and from December 1 till May 31.

**Claim 66 (original):** In a process according to claim 65, the improvement wherein the chicory has had a growing period of at least 180 days.

**Claim 67 (original):** In a process according to claim 65, the improvement wherein the chicory has been seeded in the northern hemisphere.

**Claim 68 (original):** In a process according to claim 65, the improvement wherein the roots of chicory have been grown and processed under climatological temperature conditions wherein, within a period of at least 220 consecutive days immediately preceding the end of the processing of the roots, no low temperature conditions occurred which triggered the FEH gene in chicory roots, said roots have had a growing period of at least 160 days, and the inulin obtained is improved standard grade chicory inulin with a mean average degree of polymerization ( $\overline{DP}$ ) taken over a processing period of at least 60 days, which is at least 12.

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**Claim 69 (original):** In a process according to claim 68, the improvement wherein no low temperature conditions which trigger the FEH gene in chicory roots occur within a total period of at least 240 consecutive days and the chicory has had a growing period of at least 180 days.

**Claim 70 (original):** In a process according to claim 69, the improvement wherein the chicory has been seeded in the northern hemisphere within a period selected from the periods ranging from December 1 till March 14, from March 15 till May 14, from May 15 till May 31, and from June 1 till November 30, or in the southern hemisphere within a period selected from the periods ranging from June 1 till September 14, from September 15 till November 14, from November 15 till November 30, and from December 1 till May 31.

**Claim 71 (cancelled)**

**Claim 72 (original):** In a process according to claim 65, the improvement wherein said appropriate regions comprise the Californian region of the USA.

**Claim 73 (original):** In a process according to claim 65, the improvement wherein the source material are chicory roots which have been grown and processed under the conditions as defined in claim 65, said process further comprising the steps of:

- (i) isolation of the inulin from the chicory roots yielding an aqueous solution of crude inulin,
- (ii) purification of the crude inulin obtained in step (i) yielding an aqueous solution of purified inulin, optionally followed by concentration of this solution by partial removal of the water yielding a purified inulin concentrate, and

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(iii) isolation in particulate form of the inulin from the aqueous solution or concentrate of purified inulin obtained in step (ii), thereby yielding, respectively, standard grade chicory inulin or improved standard grade chicory inulin.

**Claim 74 (original):** In a process according to claim 73, the improvement comprising:

- for step (i): extraction with hot water of the inulin from fresh slices or shreds of the chicory roots, yielding an aqueous solution of crude inulin,
- for step (ii): purification of the aqueous solution of crude inulin obtained in step (i) by depuration followed by refining, and
- for step (iii): isolation of, respectively, standard grade chicory inulin or improved standard grade chicory inulin, in particulate form by spray drying.

**Claim 75 (original):** In a process according to claim 65, for the manufacture of low sugar standard grade chicory inulin or improved low sugar standard grade chicory inulin containing in total less than 1 weight % monomeric saccharides and sucrose, by conventional techniques from chicory roots, the improvement wherein the source material are chicory roots which have been grown and processed under the conditions as defined in claim 65.

**Claim 76 (original):** In a process according to claim 75, the improvement wherein, respectively, standard grade chicory inulin or improved standard grade chicory inulin or a corresponding intermediate purified inulin, obtained by a process defined in claim 65 is used as a source material and is, in accordance with known techniques, subjected to the following additional consecutive steps:

- (iv) removal of the monomeric saccharides and sucrose, yielding a low sugar inulin solution or concentrate, and

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(v) isolating the low sugar inulin in particulate form from the solution or concentrate obtained in step (iv),  
and the product obtained is, respectively, low sugar standard grade chicory inulin with a mean ( $\overline{DP}$ ) of at least 10 or improved low sugar standard grade chicory inulin with a mean ( $\overline{DP}$ ) of at least 12, the mean ( $\overline{DP}$ ) being taken over a processing period of at least 60 days.

**Claim 77 (original):** In a process according to claim 75, the improvement wherein, respectively, standard grade chicory inulin or improved standard grade chicory inulin or a corresponding intermediate purified inulin, obtained by a process defined in claim 68 is used as a source material and is, in accordance with known techniques, subjected to the following additional consecutive steps:

(iv) removal of the monomeric saccharides and sucrose, yielding a low sugar inulin solution or concentrate, and

(v) isolating the low sugar inulin in particulate form from the solution or concentrate obtained in step (iv),  
and the product obtained is, respectively, low sugar standard grade chicory inulin with a mean ( $\overline{DP}$ ) of at least 10 or improved low sugar standard grade chicory inulin with a mean ( $\overline{DP}$ ) of at least 12, the mean ( $\overline{DP}$ ) being taken over a processing period of at least 60 days.

**Claim 78 (original):** In a process according to claim 75, the improvement wherein, respectively, standard grade chicory inulin or improved standard grade chicory inulin or a corresponding intermediate purified inulin, obtained by a process defined in claim 74 is used as a source material and is, in accordance with known techniques, subjected to the following additional consecutive steps:

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(iv) removal of the monomeric saccharides and sucrose, yielding a low sugar inulin solution or concentrate, and

(v) isolating the low sugar inulin in particulate form from the solution or concentrate obtained in step (iv),

and the product obtained is, respectively, low sugar standard grade chicory inulin with a mean ( $\overline{DP}$ ) of at least 10 or improved low sugar standard grade chicory inulin with a mean ( $\overline{DP}$ ) of at least 12, the mean ( $\overline{DP}$ ) being taken over a processing period of at least 60 days.

**Claim 79 (original):** In a process according to claim 65, for the manufacture of high performance grade chicory inulin with a ( $\overline{DP}$ ) of at least 20, or improved high performance grade chicory inulin with a mean ( $\overline{DP}$ ), taken over a processing period of the chicory roots of at least 60 days, of at least 20, which are essentially free from low molecular monomeric saccharides, dimeric saccharides and oligofructose, and essentially free from colorings, salts, proteins, organic acids and technological aids, the improvement wherein the source material are chicory roots which have been grown and processed under the conditions as defined in claim 65.

**Claim 80 (original):** In a process according to claim 79, the improvement wherein standard grade chicory inulin with a ( $\overline{DP}$ ) of at least 12, respectively improved standard grade chicory inulin with a mean ( $\overline{DP}$ ), taken over a processing period of the chicory roots of at least 60 days, of at least 12, or its intermediate, depurated or refined inulin, obtained by a process defined in claim 65, is used as a source material and subjected, in accordance with known techniques, to the following consecutive steps:

(vi) fractionation, and

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(vii) isolation in particulate form of the high performance grade inulin from the fractionated product obtained in step (vi),

thereby providing high performance grade chicory inulin, respectively improved high performance grade chicory inulin in a yield of at least 40% based on the source inulin.

**Claim 81 (original):** In a process according to claim 80, the improvement wherein standard grade chicory inulin with a ( $\overline{DP}$ ) of at least 12, respectively improved standard grade chicory inulin with a mean ( $\overline{DP}$ ), taken over a processing period of the chicory roots of at least 60 days, of at least 12, or its intermediate, depurated or refined inulin, obtained by a process defined in claim 73, is used as a source material and subjected, in accordance with known techniques, to the following consecutive steps:

(vi) fractionation, and

(vii) isolation in particulate form of the high performance grade inulin from the fractionated product obtained in step (vi),

thereby providing high performance grade chicory inulin, respectively improved high performance grade chicory inulin in a yield of at least 40% based on the source inulin.

**Claim 82 (original):** In a process according to claim 80, the improvement wherein standard grade chicory inulin with a ( $\overline{DP}$ ) of at least 12, respectively improved standard grade chicory inulin with a mean ( $\overline{DP}$ ), taken over a processing period of the chicory roots of at least 60 days, of at least 12, or its intermediate, depurated or refined inulin, obtained by a process defined in claim 74, is used as a source material and subjected, in accordance with known techniques, to the following consecutive steps:

(vi) fractionation, and

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(vii) isolation in particulate form of the high performance grade inulin from the fractionated product obtained in step (vi),

thereby providing high performance grade chicory inulin, respectively improved high performance grade chicory inulin in a yield of at least 40% based on the source inulin.

**Claim 83 (original):** In a process according to claim 80, the improvement wherein the fractionation is carried out by directed crystallization of an aqueous metastable solution of the source material, and the isolation of the fractionated inulin in particulate form is carried out by filtration or centrifuging including washing with water.

**Claim 84 (original):** In a process according to claim 81, the improvement wherein the fractionation is carried out by directed crystallization of an aqueous metastable solution of the source material, and the isolation of the fractionated inulin in particulate form is carried out by filtration or centrifuging including washing with water.

**Claim 85 (original):** In a process according to claim 82, the improvement wherein the fractionation is carried out by directed crystallization of an aqueous metastable solution of the source material, and the isolation of the fractionated inulin in particulate form is carried out by filtration or centrifuging including washing with water.

**Claim 86 (previously amended):** In a process according to claim 80, the improvement wherein the source inulin has a ( $\overline{DP}$ ), respectively a mean ( $\overline{DP}$ ) of at least 14, and the high performance grade chicory inulin, respectively improved high performance grade chicory inulin, is obtained in a yield of at least 45% based on the source material, and has a ( $\overline{DP}$ ), respectively a mean ( $\overline{DP}$ ), of at least 20, the mean ( $\overline{DP}$ ) being taken over a processing period of the source chicory roots of at least 60 days.

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**Claim 87 (previously amended):** In a process according to claim 81, the improvement wherein the source inulin has a ( $\overline{DP}$ ), respectively a mean ( $\overline{DP}$ ) of at least 14, and the high performance grade chicory inulin, respectively improved high performance grade chicory inulin, is obtained in a yield of at least 45% based on the source material, and has a ( $\overline{DP}$ ), respectively a mean ( $\overline{DP}$ ), of at least 20, the mean ( $\overline{DP}$ ) being taken over a processing period of the source chicory roots of at least 60 days.

**Claim 88 (previously amended):** In a process according to claim 82, the improvement wherein the source inulin has a ( $\overline{DP}$ ), respectively a mean ( $\overline{DP}$ ) of at least 14, and the high performance grade chicory inulin, respectively improved high performance grade chicory inulin, is obtained in a yield of at least 45% based on the source material, and has a ( $\overline{DP}$ ), respectively a mean ( $\overline{DP}$ ), of at least 20, the mean ( $\overline{DP}$ ) being taken over a processing period of the source chicory roots of at least 60 days.

**Claim 89 (original):** In a process for the manufacture of a partial hydrolysate of chicory inulin, by conventional techniques from chicory roots, the improvement wherein the source material are chicory roots which have been grown and processed under the conditions as defined in claim 65 and the product obtained is polydisperse oligofructose.

**Claim 90 (currently amended):** In a process according to claim 89, the improvement wherein respectively, standard grade or improved standard grade chicory inulin or the corresponding intermediates, depurated or refined inulin, obtained by a process defined in claim 65, is used as a source material, and the product obtained is polydisperse oligofructose containing at least 90% by weight dry substance and the oligofructose has a degree of polymerization ( $DP$ ) from 2 to 10.

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**Claim 91 (original):** In a process according to claim 90, the improvement wherein respectively, standard grade or improved standard grade chicory inulin or the corresponding intermediates, depurated or refined inulin, obtained by a process defined in claim 73, is used as a source material, and the product obtained is polydisperse oligofructose containing at least 90% by weight dry substance and the oligofructose has a (DP) from 2 to 10.

**Claim 92 (original):** In a process according to claim 90, the improvement wherein respectively, standard grade or improved standard grade chicory inulin or the corresponding intermediates, depurated or refined inulin, obtained by a process defined in claim 74, is used as a source material, and the product obtained is polydisperse oligofructose containing at least 90% by weight dry substance and the oligofructose has a (DP) from 2 to 10.

**Claim 93 (original):** In a process for the manufacture of a complete hydrolysate of chicory inulin, by conventional techniques from chicory roots, the improvement wherein the source material are chicory roots which have been grown and processed under the conditions as defined in claim 65, and the product obtained is fructose.

**Claim 94 (original):** In a process according to claim 93, the improvement wherein, respectively, standard grade or improved standard grade inulin or the corresponding intermediate, depurated or refined inulin, obtained by a process defined in claim 65, is used as a source material, and the product obtained is fructose containing at least 89% by weight fructose, calculated on dry substance.

**Claim 95 (original):** In a process according to claim 93, the improvement wherein, respectively, standard grade or improved standard grade inulin or the corresponding intermediate, depurated or refined inulin, obtained by a process defined in claim 73, is used as a

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source material, and the product obtained is fructose containing at least 89% by weight fructose, calculated on dry substance.

**Claim 96 (original):** In a process according to claim 93, the improvement wherein, respectively, standard grade or improved standard grade inulin or the corresponding intermediate, depurated or refined inulin, obtained by a process defined in claim 74, is used as a source material, and the product obtained is fructose containing at least 89% by weight fructose, calculated on dry substance.

**Claim 97 (original):** In a process for the manufacture of a derivative of chicory inulin, by conventional techniques from chicory inulin or an intermediate thereof, the improvement wherein the source material for the inulin are chicory roots which have been grown and processed under the conditions as defined in claim 65.

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